

TURBINE SPEC Comments

Daron Nissen
11/2008

Turbine Scope of Work
3.0 (Comments)

IP Turbine overall to include

Included in
Scope of Work
IP Turb Stamps/Handk (Ch)apest of the 8th Stage w/rebuilt spare
responsible for rebuilding 8th Stage ?
Installation of IP retractable packing

5.0 Design Conditions

Capacity MWh —

(I think it is prudent to ~~define~~ limit capacity to
HP Wheel Power calc versus ~~part~~. total generation.
There are too many outside influences on the cycle determining
total generation from cycle. With capacity incentives and
penalties, I doubt if we could everyone to agree on corrections. So ...)

$$MWH_{HPT+IS} = \frac{\text{flow}_{\text{throttle}}^{KPH} (\Delta h_{\text{inlet to exit}}) + \text{flow}_{\text{throttle less HP}} (\Delta h_{\text{exit to exit}})}{3412.1 \text{ Btu/kwh}}$$

16.0 Performance Guarantees

I guess I don't understand why we aren't shooting for 92.0%
(sounds as though they are achieving 93-94%).

Test Tolerances of 0.25% - why applying test tolerances at all?

GE plantlets
Cotton book

9.0 Reference Drawings

Do not include GE provided Heat Balance Programs

(GE claims they are proprietary)
Anyway, this are ~~not~~ the ones we want, you included Design.
Dave is printing up (should have done this week)

U1+U2 Acceptance Heat Balance Diagrams

U1+U2 Current Heat Balance Diagrams

15.0 Perf Testing

Measurement Uncertainty

Temperature ASME PTC 6 calls 1°F (0.1%) @ throttle

add → Flow 0.5% might be a little tight (0.05%)
0.15% final feedwater flow

two parallel points → multiple locations

for instance - throttle inlet 4 leads coming in for 4 measurement points
(versus 3 or just 2)
If only one line, we would have redundant measurements

repeatability - minimum of 2 tests that agree within .25, average results

Warranty Inspection? ~~after~~ up to 2 years if they don't meet acceptance

Need to stipulate where Extraction Point is

~~must~~ must meet heating requirements of FW heater allows additional gain of MW + 1%

(Need)

Steam Seal Clearance Diagrams

Required for perf testing, steam path audits + rebuilds
balance piston - steam flow requirements

(Need)

HP Turbine Repair+Rebuild Spec Sheets

Required blade design info to reestablish bucket and diaphragm profiles on future rebuilds

need throat openings (area/eq)

bucket + diaphragm partition profiles @ X4+T or profile gauges
radial heights

trailing edge thickness

reverse engn
~~measurements~~

(or we need time to sit down and reverse engineer when
the HP turbine comes in opened up)

(Need)

Complete list of all turbine replacements

References

and contact person

(we need to be able to contact all installations good + bad)

(Need)

Required list of Special Tools



List of Spec Parts

(Need)

HP Design - Heat Balance

where extract point is + design conditions

Vibration - Balance Specs

- Are we going to provide HP turbine ~~rotor~~ balance
spec criteria

GI ISO 1940

Supplier must provide HP turbine balance / provisions
for turbine end, generator end ^{slot} mid span and
inner + outer shell ~~perforat~~ access ports must match.

below ~~the~~ critical

TURBINE DESIGN

2400 psig throttle press (

1000 F Throttle temp

→ 6750 Throttle flow (Kg/h)

92% HP ~~Eff~~ Entropy Drop

→ 297.6 HP Wheel Power (MW)

Valve control - sequential valve operation (partial arc)